

GEC AVIONICS

# Annual Review of Activities



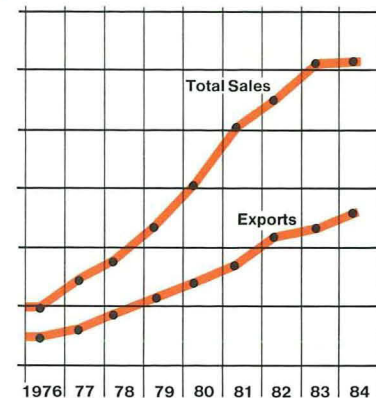


## 1984 ... eventful year

### New name – same pedigree

Members of the company team now work together under a new name, GEC Avionics Limited. This identifies, to other people, our long-established role as a major part of Britain's largest electronic and electrical company. Whether, as individuals, our origins go back to those of Marconi, in 1895, or of Elliott, in 1799, we carry forward the skills and experience with which we have together learned to succeed in world markets.

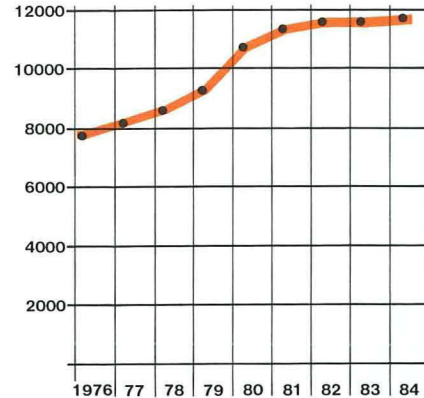
### SALES AND EXPORTS



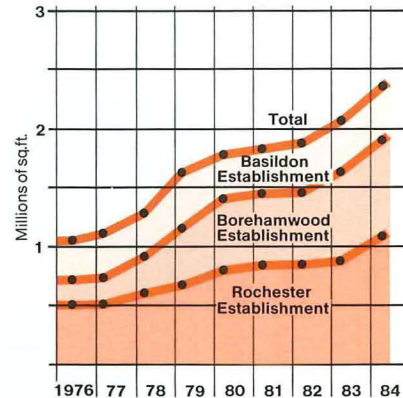
### Staying in the lead

We remain Europe's leading producer and the UK's top exporter of avionics, enabling us to sustain the size of our team during a period when many companies have declined.

### TOTAL EMPLOYEES



### UK FACTORY SPACE



### How others saw us

An important event was the change of our company name, from Marconi Avionics Limited to GEC Avionics Limited. We have for some time been independently managed from The Marconi Company and the name change, which was well-publicised, is to avoid confusion.

In 1984, our capabilities and activities across a wide range of products and programmes, received world-wide publicity. The year began with two major order announcements: AD3400 (APD) for the MOD, and AQS-902 (MASD) for the Royal Swedish Navy. New products publicised included ORION automatic test equipment (ATED) and FASTAR, a portable radar for battlefield surveillance (APHyD). TICM II (E-OPD) orders were announced for tanks and Rapier missile guidance and highly successful US flight trials of a FLIR pod were reported.

The British Army Equipment Exhibition drew attention to the company's activities in areas other than aerospace. So did widespread reports of CQD's Electro-Magnetic Compatibility testing of car electronics for Ford and other leading car manufacturers.

The Farnborough Air Show gave successful publicity to no fewer than 10 of our products and programmes. The Foxhunter AI Radar made its public debut and the company co-sponsored the FBW Jaguar which flew each day. We also announced ADD's contract to supply the new F-16 C/D HUD MASD's order from the Indian Navy for AQS-902 and their nomination by Fokker to equip F27 Maritime Enforcer aircraft. Among the innovative products announced, were a unique method of measuring the internal temperature

of an airliner's tyres (PSD) and a system for providing digitised moving colour maps (GSD).

Our sponsorship of the GEC Avionics National Gliding Championships was well publicised by the National and trade media. APD announced two new contracts at the end of the year, involving AD620K navigation systems, for the Italian company Aermacchi and AD660 Doppler Velocity Sensors for CASA, of Spain.

Marshal of the Royal Air Force Sir Michael Beetham became a Director of our company and Air Commodore 'Reggie' Spiers joined us as a Marketing Executive. The news that top designer Staff Ellis had won GEC's Lord Nelson Gold Medal gave pleasure to everyone and was well reported.

## Managing Director's Report

1984 has been another modestly successful year for the Company. As you will all know, we changed our name at the end of August to GEC Avionics and I am happy to say that this change has been quite well received by our customers who, by and large, welcome the disappearance of confusion between ourselves and other Marconi companies.

This year, we have done considerably better than we anticipated in acquiring new orders and, as I write, our order intake is up on last year's by almost 30%. However, our deliveries to customers have also increased, the net result being an order backlog increase of just over 10%.

These improvements in orders have not, however, reflected significantly into the number of people we employ which has, so far, during the year, risen by only about 100. This is partly a reflection of considerable improvements in productivity, both in engineering departments and in production, as a result of the substantial investments which the company has made in computer-aided design, improved assembly facilities and automatic test equipment.

In addition to this, however, the ever-increasing number of components which can be packaged onto a single silicon chip results automatically in a smaller requirement for our own assembly effort, whilst the demand for test and inspection will probably continue to rise.

Looking a bit further to the future, the annual increase in the UK defence budget which has occurred under the current administration is unlikely to be maintained, and we must look to a levelling off of home defence procurement in the foreseeable future.

To maintain a reasonable rate of expansion and, therefore, our total labour force, it will become more and more essential to obtain orders from foreign customers and a great deal of effort is currently being put into this aspect of our business.

May I take this opportunity of thanking you all for your efforts during the past year and wishing you a very happy Christmas.

J E Pateman CBE  
Managing Director  
GEC Avionics Limited  
6th December 1984





# Rochester Establishment

covers Rochester, Nailsea, Yeovil, and Byfleet

Foreword by  
W H Alexander OBE,  
Assistant Managing Director of GEC Avionics  
Limited and chief executive for the Rochester  
Establishment.



Business performance at Rochester continues to improve and, in spite of our general concern about the dearth of new aircraft programmes, both sales and order books are being maintained. Exports account for well over half of our sales and whilst the United States remains our largest overseas market, we are achieving success in many parts of the world, especially in the avionics retro-fit business.

During the year we have made some progress towards developing more of the control of the business into two groups of divisions under Peter Hearne and Ron Howard by strengthening their teams with some senior appointments. The organization chart printed below illustrates this grouping. In line with this movement I have invited Peter and Ron to make their own reports for their parts of the Company and I shall restrict my comments to some points of general interest.

The most noticeable sign of progress in looking round the establishment, is the considerable increase in the use of computers to accomplish the commercial and technical tasks. The area occupied by EDP has been refurbished and the ICL 2966 installed. With over 200 terminals throughout the factory they are now able to offer a really effective service to divisions

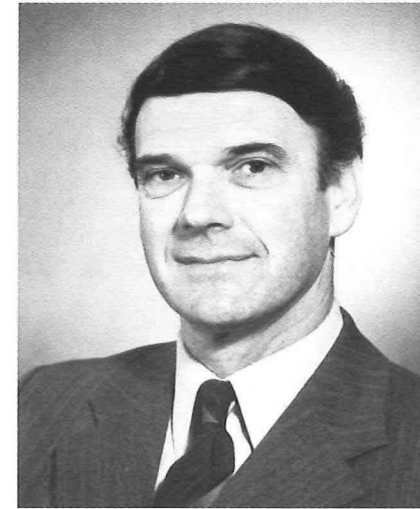
and central departments. The increased use of microprocessors and word processors has also improved our efficiency and I should like to pay tribute to the way that all employees are taking in their stride the rapid changes in technology.

The EMC facility of CQD, re-housed and expanded at Gads Hill, is one of the few of its type in the country and continues to be well used, even by outside customers such as the motor car industry. Personnel, Works Engineering and Accounts Departments have given valuable service during the year. Works Engineering are currently drawing up plans for the use of the space in the main factory, vacated by Fishers. The Canteen is appreciated by visitors from our customers as well as by the regular users. The recent dinner for the Long Service Association was superbly done.

Our ability to sell competitively throughout the world is largely dependent on the quality of our designs and it was a pleasure to see this recognised by the award of the Nelson Gold Medal for Design to Staff Ellis.

Finally, I should like to thank all employees for their contribution to the success of our business during the last year.

Foreword by  
R W Howard,  
Director and General Manager of  
GEC Avionics Limited and the chief executive  
responsible for CACD, FARL, FCD, ISD,  
PCSD and PSD.



**Combat Aircraft Controls Division** continues manufacturing Tornado AFCS with over 500 equipment sets delivered. Prototype AM-X computers have performed well in flight trials. The Jaguar FBW programme was successfully completed, with the ACT demonstrator flying in the maximum unstable configuration at Farnborough '84. EAP AFCS development is progressing well, with rig equipment now under evaluation. New business opportunities associated with LRSOM, Standard Autopilot and aircraft retrofits are being aggressively pursued with encouraging results.

**Flight Controls Division** has successfully flight-demonstrated Phoenix, its contender for the British Army Surveillance Unmanned Aircraft requirement. Following deliveries of more than 200 slat and flap computers for the A310 and A300-600, FCD has been selected to supply the SFCC on the new Airbus Industry A320. Aerial target work has expanded with a contract to provide demonstrator



The Company's pilotless surveillance aircraft shown contending for the Army's Phoenix programme.

While most Flight Group turnover has come from long running programmes such as Tornado, Cobra, Boeing 747 and Lynx, these are all past their peak production rates and efforts are directed to finding new opportunities for profitable future production.

In addition to maintaining our lead in traditional markets, we are seeking to develop new products and services.

With the Phoenix programme, FCD anticipates a new area of business. Similarly, CACD has made strong proposals for management of a major A-4 retrofit programme and is working on Long Range Stand-Off Missiles with Boeing, British Aerospace and MBB. ISD is developing new products for ejection seat control and ice detection. PSD is developing Maintenance Data Panels and Standby Instruments for EAP while flight tests of a Tyre Temperature Monitor continue on a BAe 146.

ground station equipment for the Llanbedr range. Production for Boeing 747, BAC1-11, Lynx, Rapier and unmanned aircraft continues.

**Powerplant Systems Division** continued to install its products across the world. Automatic Powerplant Test Systems were completed in Canada, Italy, Germany and Britain. Supervisory Control, already in service with seven airlines, and Fuel Measurement equipment, with a potential order for the US Navy T45, show an improving order situation. Among next generation products, the Tyre Temperature Monitor had a successful flight trial and Liquid Crystal Reversionary Displays received enthusiastic user reports.

**Instrument Systems Division's** international order book includes the helicopter low airspeed system, with over 800 now delivered to seven countries. The Tornado Stores Management System development programme has recently been extended to incorporate the control of the ALARM missile. The USAF and USN Standard Central Air Data activity, now fully qualified, is nearing the production competition stage. New products being introduced include microprocessor controlled equipment for ejection seat control and an Ice Detection System.

**Power Conversion Systems Division** was formed in July 1984, consolidating the growing power conversion business at Nailsea into an autonomous division of the Company. In addition to the supply of PCUs to major programmes such as TORNADO,

Future growth is confidently based on this balanced mixture of existing and new products, projects and business areas.

The principal manufacturing divisions are ably supported by the newly formed Power Conversion Systems Division and by FARL.

With successes in the Magnus and Montanazo programmes and studies on underwater vehicles, Offshore Projects Group is acquiring the reputation needed for future growth.

While working to consolidate our market position, the efficiency of internal operations has not been neglected. Substantial investment has been made in computer aids for design, development, manufacturing and administration, supplemented by recruitment and training of the highest quality staff.

Against this background we can face the future with confidence.

SCADC and SPEARFISH, development projects are under way, including PCUs for EAP, EH101 and LAPADS programmes. Throughout the year, active marketing has continued both internally and outside GEC and decisions are awaited on a number of major proposals.



Award-winning VLSI 'chip set' module is more competitive than conventional electronics.

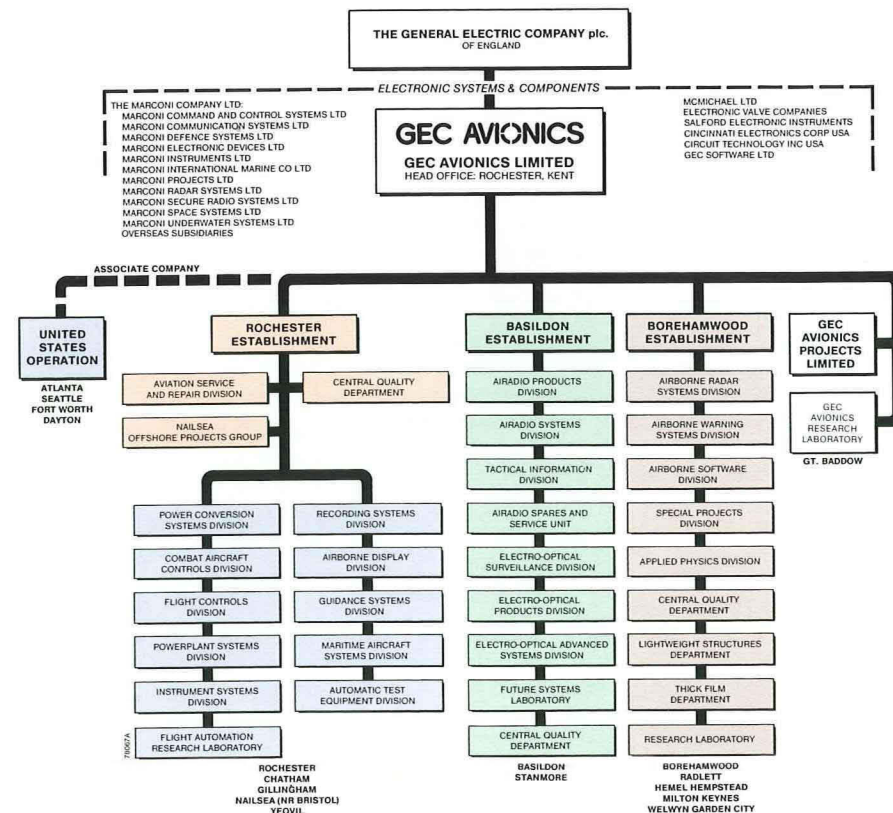
**Flight Automation Research Laboratory** The expertise offered to Product Divisions by FARL engineers is typified by their winning entry in this year's Haskett Trophy Competition - the design, development and implementation of the MIL STD 1553B Data Transmission Chip Set using very large scale integration (VLSI). Used in many Company products, this device has provided a lead over competitors. An advanced Digital Map system for RAE and a Fly-by-Light Flight Control system for Airship Industries have been completed.

The Board of GEC Avionics Limited is:

Chairman: Sir Robert Telford CBE  
Managing Director: Mr J E Pateman CBE  
Assistant Managing Director: Mr W H Alexander OBE  
Financial Director: Mr D C Rickard  
Directors: Mr P A Hearne  
Mr R W Howard  
Mr W R Paterson  
Marshal of the Royal Air Force  
Sir Michael Beetham GCB CBE

Dr B J O'Kane CBE is Consultant to the Board

Non-Board Directors are:  
Technical: Prof J T Shepherd  
Commercial: Mr C C F Naylor  
Personnel: Mr E J Bradley





Foreword by  
P A Heame,  
Director and General Manager of  
GEC Avionics Limited and the  
chief executive responsible for ADD,  
ATED, GSD, MASD, RSD and MAv Inc.



The past year has seen some important Nav Group successes and new moves to improve future competitiveness.

The rapid entry into production of the F-16 C/D HUD against an order requirement already approaching 1,000 systems, was a remarkable effort by ADD who were also involved in successful night attack developments on the LANTIRN F-16 and the TA-7C.

MASD continued to win export orders for AQS 902 LAPADS, from Sweden and India and has teamed with Fokker for ASW systems for the F27 Maritime Enforcer. A breakthrough in the US market was made with the start of comparative flight trials in a LAMPS 1 helicopter and with Grumman's selection of AQS 902 retrofit S2 trackers.

ATED successfully launched its new ORION automatic test system for

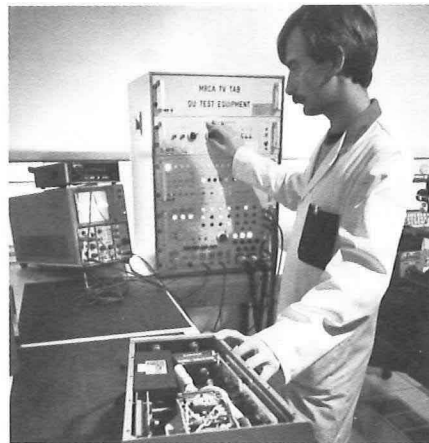
aerospace and defence customers. Marconi Instruments is also to market the system for commercial customers.

Guidance Systems Division, GSD, was formed from IND and Gyro Division to give a combined capability better matched to our competitors. GSD's Digital Map Display has aroused great interest and is being considered for new generation US fighters.

Recording Systems Division moved from Byfleet, where the lease was expiring, to excellent new facilities at Nailsea.

Of importance to the whole company, Marconi Inc. moved into its new 85,000 sq ft Atlanta facility which has an expansion potential to 200,000 sq ft. It is now able to support present and future US business and allows for further growth in engineering and production.

**Airborne Display Division** has seen a year of significant achievement and activity, maintaining a healthy order book. The USAF F-16 C/D and LANTIRN HUD programmes matured and new business was obtained in the Middle East. Demand for avionic systems based on an advanced HUD is still high. Marketing is extremely active and encouraging, particularly in the Far East. Following Night Vision Systems demonstrations in the USA, orders for the 'Cats Eyes' Helmet Mounted Displays are expected imminently.



Tomado's 'TV Tabular' unit is an example of the Company's electronic head-down displays.

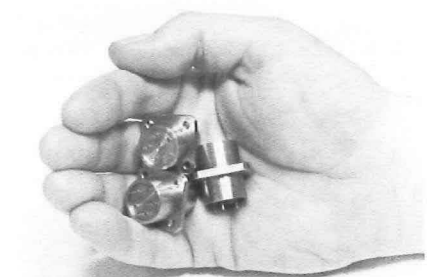
**Maritime Aircraft Systems Division** is delivering a second buy of its advanced acoustic processing system, AQS-901, to the RAF and RAAF. AQS-902 is being further expanded for the Royal Navy and has been ordered by both the Indian and

the Royal Swedish Navies. AQS-903 continues in development for the EH101. Avionics Mission Systems are on order for the Indian Navy and have been selected for the Fokker Enforcer. Further export orders for products are expected.



Anti-submarine Mission Systems are selected for the Fokker Maritime Enforcer aircraft.

**Guidance Systems Division** was formed in August from Gyro and Inertial Navigation Divisions. Its products are systems and sensors for land, sea, and air navigation and



New product - low cost rate sensors revealed at Farnborough Air Show.

guidance of missiles and torpedoes. The Digital Colour Map Unit is gaining particular attention in the USA. The land navigation system continues successful trials including gun applications. The low cost START gyro is under test for new munitions. The Spearfish torpedo strapdown guidance system is entering production. A new attitude and heading reference system is being developed.

**Automatic Test Equipment Division's** newly launched ORION Test Systems have many applications, from car park ticket machines to advanced flight control systems. ORION is attracting interest in North America and will be in service with the USAF in 1985. All Nimrod ATE equipment has been delivered. Tornado ATE is being used with increasing confidence by UK, German and Italian Air Forces. Further work is anticipated from TICM, TIRF and non-military requirements, especially in the automotive industry.

**Recording Systems Division's** move to Nailsea has been welcomed by customers. Recent proposals have yielded production contracts assisting the Division in establishing itself as a major supplier of severe environmental recording systems. Equipment for British Gas Corporation continues to be an important aspect of the Division's business, with development and production programmes anticipated. As part of its growth programme, the Division is adopting responsibility for advanced flight data and crash survivable recorders.

**Marconi Avionics Inc.** continues co-manufacturing Head-Up Displays for the A-4, A-7 and F-16 A/B aircraft. Product support work for Company products in continental USA continues and special projects included flight trial support of SCADC and the Basildon TICM II system, part of the night vision system flown in a TA-7C at China Lake. Development of CO<sub>2</sub> laser equipment continues and current modest sales could increase. A special event has been the completion and occupancy of the new Company headquarters and manufacturing facility in Atlanta, formally opened by Senator Sam Nunn (D) Georgia on 29 October, 1984.



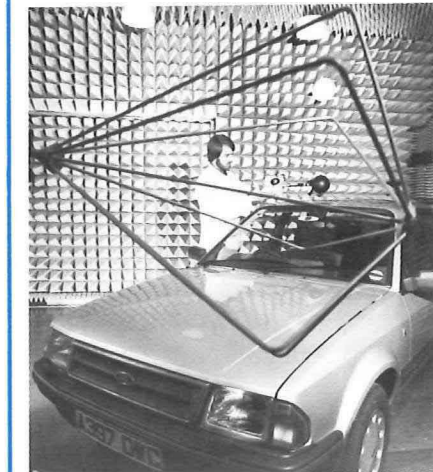
Marconi Avionics Inc's new 15 acre facility opened in Atlanta on 29 October.

**Offshore Projects Group's** work for oil companies during the year included the development of a new subsea control system for Chevron. Next year, equipment will be installed in the world's deepest subsea completion in the Montanazo oilfield in the Mediterranean. Studies have also been conducted for Shell, Exxon, Occidental and Statoil. Initial development of the Dragonfly Remotely Operated Vehicle (ROV) is nearing completion and the first vehicle will commence underwater trials shortly.

**Aviation Service and Repair Division** has started support programmes for Nimrod and Stingray products of Recording Systems Division. The British Caledonian BAC 1-11 Cat 3 autoland retrofit programme is about to commence. Logistics Engineering has completed a feasibility study for a major Air Staff Target for GAv Basildon/BAe and further work is expected. Technical Publications' workload continues at a high level. The Customer Training School will expand to six classrooms and raise instructor strength to twelve to meet new programmes.

**Central Quality Department** provides environmental test facilities, and mechanical, electrical and environmental calibration. The new

location for the Mechanical Standards Laboratory has vastly improved the working environment and consequently improved turnaround time. Both environmental test houses continue to diversify their activities, notably the Electromagnetic Compatibility Laboratory. There, avionics testing techniques have been adapted to provide a service to the automotive industry in evaluating electronic systems which are used increasingly on today's cars.



Test facilities for 'electromagnetic compatibility' are now being used for most UK car manufacturers.

**Electronic Data Processing** continued to extend its services and facilities to meet Divisional and corporate requirements. A new ICL 2966 computer allows additional Divisions to use developed MAPLE software and will allow the extension of MAPLE facilities based on the ICL product OMAC29. The establishment of the EDP Information Centre provides a focal point where distributed resources systems can be evaluated, advice and guidance obtained, requirements discussed and hardware and software information collated.

**Works Engineering Services'** energy conservation studies resulted in two sites being converted from oil to natural gas for space heating. The move of Recording Systems Division from Byfleet to Nailsea was completed and twelve layouts were changed for other divisions. The Telephone and Telex Department added Facsimile to its services and the Transport Department expanded its European service. The Mailing Department was re-organised following the move of Fisher Controls Ltd from the site.

**Accounts Department's** main achievement has been the final transfer of accounting systems from the 503 to IBM and ICL computers. These systems will now be enhanced using a

combination of mainframe and microcomputer programs. Accounting services are now provided to GEC Avionics Projects, GEC Software and the Sports and Social Club in addition to Rochester and Nailsea. A further task is the consolidation of accounts and budgets of all GEC Avionics units.

**Central Machine Shop's** primary role continues to be the supply of high quality mechanical assemblies and component parts to Rochester-based Divisions. The introduction of automatic controls into the anodising line of the Process Department has improved product quality. Redux bonding activity has increased, owing partly to new demand from Borehamwood and Basildon establishments.

**Personnel Department.** Important to engineering recruitment and retention was the career and employee development service for Rochester and GEC group careers. Publicity to schools yielded good applicants for company sponsorship schemes. The 1984 'Women in Science and Engineering Year' was supported. Welfare emphasis was changed to occupational health and preventive medicine. To meet the growing need for software staff, trainee programmer intake was increased to 50. Training schemes provide 150 employees/year to Divisions and 90 of 136 YTS intake in 1983 are now in jobs.

**GEC Avionics Research Laboratory,** Great Baddow, undertakes Company research in optics, IR, air radio and radar techniques and associated signal processing, and provides advanced stabilisation and servo support. Current projects include computer generated holographic optics for display and optical scanning and the application of holography to IR systems. Specialisation in passive and covert IR and radar targeting techniques include 3-5mm thermal cueing and synthetic aperture radar. Avionics-related research at universities is also supported.



Customer support takes place 'up front' as well as behind the scenes.



# Borehamwood Establishment

covers Borehamwood, Radlett, Hemel Hempstead, Welwyn Garden City, Milton Keynes and Peterborough

Foreword by  
D I Jackson,  
Chief Executive of the Borehamwood  
Establishment of GEC Avionics Limited.



The last year has seen considerable progress being made in many areas, but difficulties are still being experienced in completing the development of the complex Nimrod AEW Mission System in the challenging timescales required by the customer. Nevertheless, the continuing development programme is making good progress, and over 50% of the production systems have been delivered. There is every expectation that the RAF will have a very fine AEW capability with the AEW Nimrod aircraft, albeit a little later than they were hoping to see it.

Foxhunter radar deliveries are now on schedule, and the extensive flight testing of the system has shown the impressive performance capability of the system.

Although our order book is currently very healthy, there are also substantial and growing export

opportunities for our products which we are actively pursuing. In particular, there is serious world-wide interest in fitting our AEW Mission System to various overseas aircraft, and much marketing and engineering effort is being put into developing these opportunities.

The development and application of new technology is essential to success in the airborne radar business, and therefore it is important that we maintain a healthy level of research and development activities both in the Research Laboratory and in the product divisions.

## Airborne Software Division.

Flight trials of mission system software for the AEW Nimrod and Foxhunter radar continue satisfactorily. Software for the AEW Training Simulator has progressed to schedule and is now entering final integration. Two major courses to train RAF software maintenance teams have been completed. The Software Training School is now extending its range of Ada training. Work has begun on two Alvey collaborative projects involving Intelligent Knowledge-Based Systems (IKBS) and software tools.



Software engineering is making an increasing contribution to mission systems of every kind.

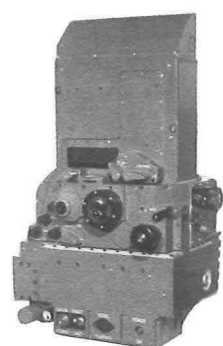
## Airborne Radar Systems Division.

Deliveries of AI24 Foxhunter radars are well under way. Recent trials in Tornado F2 aircraft confirm that Foxhunter leads European competitors in long range, multi-target tracking capability. The Sky Ranger low-cost ranging radar is being delivered, as part of the GAv Enhanced Avionics System, for up-dating lightweight fighter aircraft. Preliminary work is being done on developing a family of multi-mode radars, aimed at the European Fighter Aircraft and future lightweight combat aircraft.

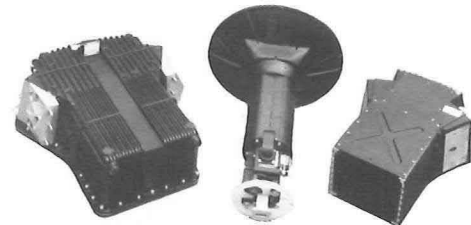
## Airborne Warning Systems Division

has supported RAF evaluation of AEW Mission Systems Avionics in parallel with continuing development and production programmes. The build-up of support facilities at RAF Waddington for AEW Nimrod is well advanced, including the Mission Simulator and the Mission Analysis and Software Maintenance facilities. World-wide demand for a low cost AEW aircraft grows and GAv's AEW Mission System fitted to a variety of available aircraft could be a prime contender.

Extending the product range:-



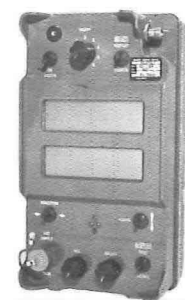
CO<sub>2</sub> laser tank sight.



SKYRANGER lightweight airborne radar.



FASTAR battlefield radar.



HERMES remote target sensor.

## Special Projects Division

continues to supply the RN with advanced passive sonar systems. These have been installed in four Leander class frigates and two Trafalgar class submarines. A further six submarine systems will be in service by 1986. Using its acknowledged expertise in acoustic signal processing, the Division is about to launch new equipment, for military and civil applications, in markets not normally available to GAv.

## Applied Physics Division

is preparing to tender for two large MOD projects, namely Mstar, a man portable surveillance radar, and BRSS, a battlefield remote sensor system. Experience gained with ZB298 and Hermes should enhance prospects of success. The Division is meeting success in the USA, with sales of X-ray topography systems to many large semiconductor organisations and high intensity generators to the molecular biology research community.

## The Research Laboratory

gives technological support to Divisions, carries out feasibility studies and advanced development, and provides expertise and information for systems design, engineering, manufacturing and marketing. Some thirty R & D items include coherent laser detection techniques, optical signal processing, and reconfigurable electronic signal processing including the Laboratory's Custom Chip Design which has a variety of applications. Other R & D items are microwave integrated circuits, advanced scanning aerials and systems studies for future manned and unmanned aircraft.

## Central Machine Shop

provides the mechanical manufacturing and assembly facility for Borehamwood Establishment's contracts. This service has substantially improved through increased familiarity with the expanded numerically controlled machining plant. Further improvement is anticipated from

the introduction of computerised purchasing and production control procedures and an expansion of the work-force.

## The Model Shop

at Borehamwood, Radlett and Milton Keynes supports all Herts and Bucks divisions. An important function is close support of Research Laboratory projects, exemplified by the manufacture of prototypes of the Advanced Scanner. The highly skilled craftsmen are making a substantial contribution to manufacturing mechanical and electrical assemblies for the AEW Mission System Avionics, the Tornado ADV radar and other projects.

## Central Quality Department

has developed its services through the introduction of the Component and Materials Engineering Section which is producing a component database for use within the Establishment's On-Line Purchasing System. The Central Calibration Laboratories have further refined their capabilities to calibrate pressure, vacuum and torque measuring instruments. The Environmental Test Laboratory has maintained its level of participation in qualification testing for the AEW Nimrod, AI24, MADS 7 Radars and the 2026 Sonar System

## Thick Film Department

has continued to expand production of thick film microcircuits for Divisions and external customers. This includes the Ministry of Defence, where progress on the design of several items has led to more orders. The recent acquisition of automatic component placement and wire bonding machines has significantly increased production capabilities.

## Lightweight Structures Department

is the design and manufacturing centre for advanced

composite materials technology in GEC Avionics. Experience gained through production of antennas for AEW Nimrod and Tornado ADV has been successfully applied to numerous requirements for high technology lightweight antennas and radomes throughout the UK. This experience has been reinforced by a carbon fibre development programme. Recent spin-offs from this technology include a break-through into the commercial aircraft interiors market.

## Central Publications Department

provides a complete documentation service embracing handbooks, specifications and software documentation. It also edits and prepares sales proposals, brochures and reports. A comprehensive reprographics facility includes printing, illustrating, book-binding, photography and typesetting. Word processing, employing optical character reading and typewriter links (Word-Net), is also provided. A fast, high quality, 35mm and 16mm microfilm service is available.

## Accounts Department's

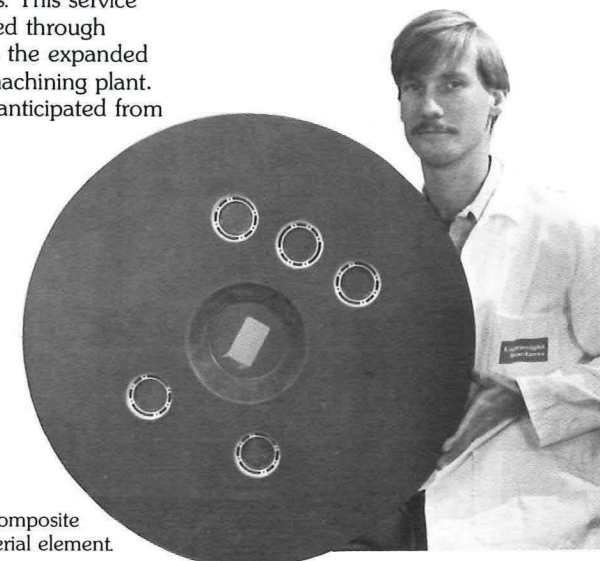
major task of the year was to take over the data processing operations and data preparation responsibilities from GEC Computer Services Ltd. Despite initial problems, a full service is now provided to the Divisions and Central Departments at Borehamwood. The MECCA system has been introduced for purchasing activities and extension of its scope is being examined.

## Personnel and Training Departments.

With emphasis on engineering and software requirements, 551 people have been recruited during the year in a highly competitive market. Training facilities have been doubled in size to provide specialist engineering courses with concentration on supervisory and management development programmes. In particular, they will provide most of the off-the-job technician apprentice training and increased Youth Training Scheme participation. The exceptional success of this year's students on the M. Eng degree sponsored course at Bath University will encourage extension of the arrangement.

## Site Services

directed the construction of the new Laboratory and Canteen/Social Club buildings at Milton Keynes. These were taken over during the summer. A new Reliance SLX digital telephone exchange has been installed at that site. Schemes for more efficient and cheaper use of energy have been introduced at all sites.



Advanced carbon fibre composite and honeycomb radar aerial element.



# Basildon Establishment

covers Basildon and Stanmore

Foreword by  
W R Paterson,  
Director and General Manager of  
GEC Avionics Limited and the chief  
executive for the Basildon Establishment.



Based on a good order book, saleable products and a sound technical capability, 1984 has been a year when the site improved its position in the marketplace. Several new programmes got under way this year and if successful will lead to significant orders over the next five years. The production order for the Wideband Secure Speech System was good news. Great effort is being directed at the export market, in particular the USA. Again, thanks are due to the staff operating overseas and away from base. A special mention must be given to those involved in the airborne thermal imaging trials at China Lake in the USA. Successful trials were also conducted on board the aircraft carrier USS Enterprise.

The Government's declared policy is to increase competition in defence procurement. The divisions are adapting to take account of the tougher stance adopted by MOD(PE).

Basildon products and capability depend on advanced technology. To cope with changing circumstances, there is a continuing need to uprate the site's technical skills and investment. The training and investment programmes in 1984 bear witness to the site's commitment to staying up with the leaders.

1985 can be approached with confidence. However, the challenge of being and staying competitive must be accepted by everyone involved in the operations.

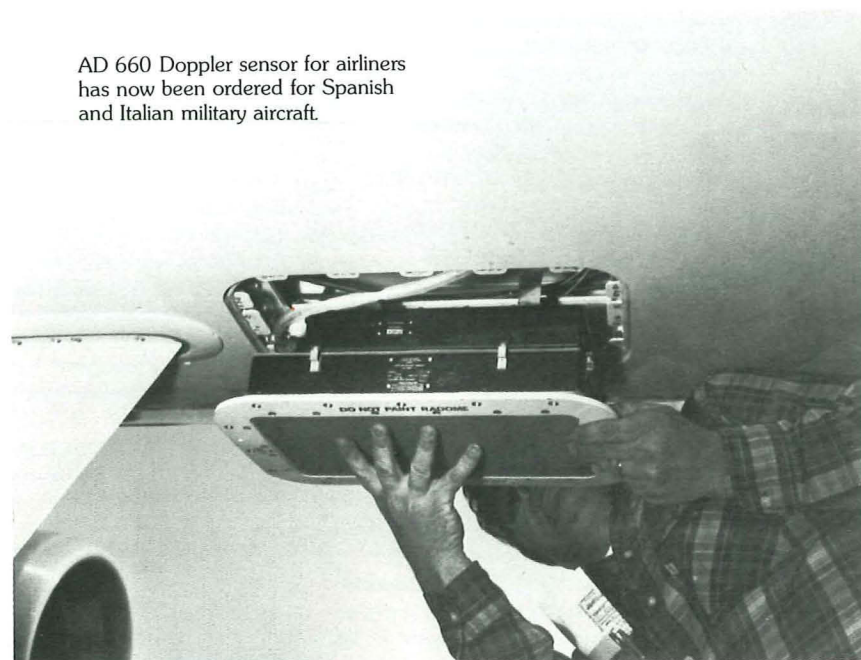
**Airadio Systems Division** has completed the design and production of the AEW integrated communications system and continues with product support and simulator upgrades. There is high production activity to supply digital speech systems for maritime aircraft and full development of the EH101 communications system is proceeding. Automatic Speech Recognition is being examined for inclusion in avionics systems of the future.

**Tactical Information Division** has been formed within the Airadio Group of Divisions because of the magnitude and importance of the Systems engineering contract to introduce JTIDS (Joint Tactical Information Distribution System) to UK Air Defence. TID will exploit further application of JTIDS and related technology.

## Airadio Products Division.

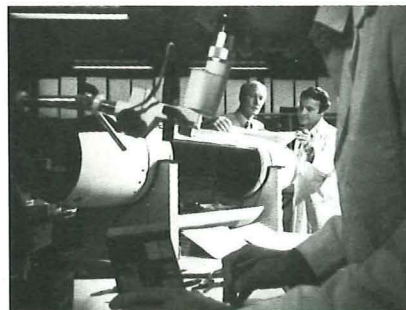
Recent orders include the first for the AD620K advanced navigation system, from Italy, AD660 Doppler Velocity Sensor and navigation computers, from Yugoslavia and AD660 from Spain. There is world-wide interest in the Low Cost Anti-Jam data system and AD150 Voice Conditioning Unit. New applications of the Division's doppler measuring techniques includes a speed sensor fitted to a MAGLEV Mass Transit vehicle at Birmingham Exhibition Centre and shell velocity measurements for army gunnery.

AD 660 Doppler sensor for airliners has now been ordered for Spanish and Italian military aircraft.

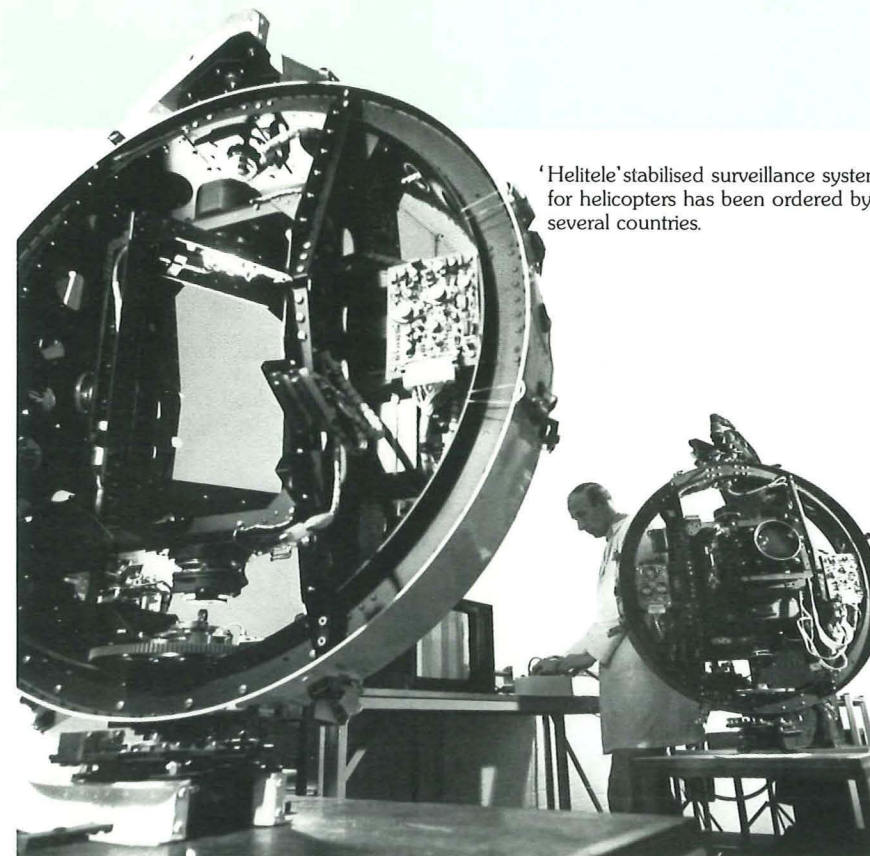


## Electro-Optical Surveillance Division

has delivered many Thermal Imaging Common Modules for UK defence programmes and won a second major production order for MOD. The successful trials of the TICM II FLIR with the US Marine Corps in California should help the Division to win production contracts in the USA. Building of the ASETS gimballed platform for the US Air Force has started. Impressive imagery has been obtained from the FLIR turret built for the company's Phoenix contender.



FLIR night vision pod for aircraft has proved its success in US trials.



'Helitele' stabilised surveillance system, for helicopters has been ordered by several countries.

## Electro-Optical Advanced Systems Division.

Flight trials of thermal cueing equipment for target tracking have been successful. Further trials in the USA are scheduled for 1985. International collaborative projects include a US missile fire control system and thermal sights for TRIGAT, a European anti-tank weapon system. Production programmes for the Stingray Signal Processor, the Spearfish Disc Correlator and TV recording systems for Seawolf are major contributors to the Division's business.

## Electro-Optical Products Division

has further production contracts for EO guidance units for the Army's Javelin missile system. Export orders are expected shortly. The V3800 naval fire control thermal imager development is nearing completion and production orders have already been received. Proposals have been submitted to the Royal Navy and other navies, for imagers to be integrated with surveillance, guided weapon and gun systems. Other development activities include fibre-optic transmission systems and charge-coupled device solid state imagers.

## Airborne Radar Systems Division

continues to manufacture power supply units and transmitters for the Tomado's terrain following radar. Over 400 LRUs have been delivered to AEG-Telefunken, Ferranti and Fiar. The Foxhunter radar for the Air Defence version of the Tomado has moved into full production. LRUs for the first twenty pre-production radars have all been

delivered to Borehamwood for system integration. LRUs for the main series production batch have also been completed.

## Future Systems Laboratory

continues to expand both in size and activity. Major emphasis is on future systems definition and operational analysis supported by engineering of prototype equipment for evaluation by potential customers. Designs for an electro-optical simulator for BAE, a new high volume data store and a fibre optic video distribution system for future aircraft are well advanced. Applied research projects, expected to result in products within five years, include IR Staring Array Sensors, new forms of imagers and automatic recognition systems.

## Central Machine Shop,

continues to be supported by investment in numerically controlled machine tools and computerised control systems, improving production and service to customers. A 12-pallet machining centre was added this year. A computerised Manufacturing Control System, now fully operational, was also purchased with support of a Department of Industry grant. 90% of machined parts and mechanical assemblies produced go to Basildon Divisions. Most of the remainder are supplied to other GEC Avionics Establishments.

**Central Quality Department** was formed during 1983. Activities include Central Quality Assurance,

Standards Calibration and Repair, Quality and Engineering Standards and Manuals, and Software Quality Assurance and Control. Central QA covers activities in connection with administration and conduct of system and product audits, including vendor assessment and audit. The major responsibility is Software QA and Control, covering development and preparation of Software Codes of Practice and Procedures, and conduct of software audits.

## Works Engineering Department,

responsible for implementing management policy to uprate Basildon facilities, has reworked two site buildings, greatly improving production areas and the working environment. The need for energy control and conservation justified the purchase of new heating and ventilating systems to replace old, inefficient equipment. Considerable savings in fuel costs are already being achieved. The work to accommodate two newly formed Divisions is proceeding.

**Services Control** continued to provide communications, transport, central purchasing and stores services. Communications have further improved with the installation of the Communication Data Network for sourcing computers on site and off site.

**Accounts Department** has completed the change of the Cost Code numbers, started in early 1984. A substantial programme of systems enhancement and development is in hand. The first phase involves using microcomputers to mechanise the nominal ledger, the site budget consolidation and site accounting reports, all of which is being undertaken by existing staff. Future phases will direct attention to Chelmsford Computer Centre main frame systems including transfer to the MECCA (Manufacturing Engineering Cost Control Application) system.

## Personnel and Training Departments.

The intake of engineers and technicians increased during the year and, in particular, over 50 direct entry graduates were recruited. The overall number of employees has now increased to 2350. The Training Department maintained its normal levels of apprentices and trainees, and successfully completed the training of 30 YTS trainees this year. In addition, it launched a new 2 year accelerated technician training programme for 'A' level school leavers.



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